

# **Determining Optimal Policies to Maintain the Strategic Mix and Force Readiness of Enlisted Military Personnel**

## **Abstract**

Maintaining required force strength is a critical component of military workforce planning. This is also a complex problem given the hierarchical structure, large number of personnel, the uncertainties associated with promotions and separations. We develop a stochastic model of military workforce planning that incorporates these uncertainties to create realistic models to maintain desired levels of force readiness. We first derive algorithms for the optimization of single-period planning scenarios, minimizing overage, underage costs and associated training costs for enlisted personnel. Specifically we develop a modified newsvendor approach for the recruitment problem. We also provide extensions that incorporate promotion caps, evaluate retention policies, as well as risk-adjusted solutions that ensure a minimum probability of maintaining target force levels. We then extend these models and test our algorithm within a dynamic multi-period framework. Simulations are performed at each stage to ensure the models and results are consistent with the underlying stochastic problem.